Proctor/Testing Center: Please enter:	
Test Date: 6/23/17	Initial: _____ Station #
Time Started: 6:50 pm	Initial: _____
Time Finished: 7:55pm	Initial: _____

PROCTORS: Please either email or fax the completed quiz to enhmwk@okstate.edu or 405.744.5033. Please keep the original copy for your records, the instructor may request it at a later date. (All copies need to remain in your file until a month after the semester ends.)

STUDENT(S), INSTRUCTOR, & TEST DETAILS

Exam Type: ☐ Student Disability Services (SDS) Exam ■ OSU Course Exam (non-SDS)

Student Name(s): (b)(6)

Course Name: Engr Economic Anal & Econ Decision Analysis

Course Prefix/Number: IEM 3503/3513

Test/Exam Title: Test 2

Test Date (as arranged with student): 6/22-26/17

Test Time (as arranged with student): 8:00 - 5:00

Class Time allowed for test: _____ Hour(s) and 75 Minutes

Instructor Name: Terry Collins

Other Institution Name: OSU

Instructor Phone: 405-744-6055

Instructor Email: terrry.collins@okstate.edu

Department Phone: 405-744-5148

Is the Test ■ Paper-Based or ☐ Online?

Is Test Date flexible? ■ Yes ■ No

Is Test Time flexible? ☐ Yes ☐ No

TEST ADMINISTRATION INSTRUCTIONS

Testing materials required/allowed by the instructor:

- ■ Notes
- ■ Textbook(s)
- ☐ Scratch Paper
- ☐ Blue Book
- ☐ Orange Scantron
- ☐ Green Scantron
- ■ Mechanical Pencil
- ☐ Highlighters
- ☐ Graphing Calculator
- ☐ Non-graphing Calculator
- ☐ Computer Use
- ☐ Ruler/Straight Edge
- ☐ English Dictionary
- ☐ Language Dictionary
- ☐ LockDown Browser
- ☐ Colored Pencils

Additional Instructions, Directions, Requirements, Passcodes, or Other Information:

Attach notes (8 1/2 X 11) to test when submitted for grade.
No cell phones or back packs in testing area.
See test for complete instructions

Statement of Academic Honesty

The following form is standard procedure for an exam that may be offered multiple times. Read the material below, then complete the form and return it with your completed exam. Your exam will not be graded unless a completed copy of this form is on file.

Course: IEM 3503/3513 Summer 2017

Test: Weekly Test # 2

There are others who may be taking this exam or a similar exam at a later date. You are in no way to have any form of direct or indirect communications regarding this exam with anyone. If someone asks something as simple as "How was it?" your best response is "I cannot talk about the exam." Any violation of the letter or spirit of the above will be treated as an act of academic dishonesty.

By completing the information below, I acknowledge that I have read and understood the Statement of Academic Honesty above.

Name (signature) _____

Name (print): ⬛ *(b)(6)* _____

Student ID: ⬛ *(b)(6)* _____

Today's Date: 6/23/17 _____

NAME: ██████████ (b)(6) ██████████

DR. COLLINS

TEST #2C (ON-LINE SECTION ONLY)
TIME LIMIT: 75 MINUTES
TEST TIME WINDOW: THURSDAY, JUNE 22, 2017 (8:00AM) TO MONDAY
JUNE 26, 2017 (5:00PM)

(OPEN BOOK, ONE PAGE OF NOTES – 8 ½ X 11)
Attach Notes Page to back of Test when submitted for grade
ABSOLUTELY NO CELL PHONES OR BACKPACKS IN TESTING AREA!!!

Multiple Choice Questions: For each Multiple Choice question below select the
most nearest answer from choices A – D. Properly write your selected answer in the
blank beside the corresponding question. Each M/C question is worth 10 points
each.

(10) __C__ 1. A company has arranged to borrow $50,000 today at 10%/yr/yr
interest. The loan is to be repaid with end-of-year payments
according to the following schedule. __Find "X", the amount that will
pay off the loan at the end of year 5.__

End of Year	Payment Amount, $
1	13,000
2	12,000
3	11,000
4	10,000
5	X

$\mathcal{E} = 47000$

A. $21,210 $80525 - 47000$
B. $28,952
C. $33,677
D. $41,318

(10) __D__ 2. Maximilien wishes to accumulate $3,000,000 in 30 years. If 30 end-of-
year deposits are made into an account that pays interest at a rate of
8.5% compounded annually, what size of deposit is required each
year to meet Luis' stated objective?

A. $62,174
B. $31,150
C. $48,938
D. $24,150

$$F = A \left[\frac{(1+i)^n - 1}{i} \right]$$

$$= 24\,150 \left[\frac{(1+.085)^{30} - 1}{.085} \right] = 2999785.61$$

$$\approx 3,000,000$$

2

OSU evaluated sealed bids on three financing packages for the construction of the new dormitory facility located on Hall of Fame road across from the Colvin Center. The first bid was from GE Capital bank, followed by Wells Fargo Bank with the second bid. The third bid was from Financial Management Corp (FMC). Each institution claims their rates were the best available for the construction project. Answer the next four questions based on the information below. (NOTE: For financial purposes assume 52 weeks per year, and 365 days per year.)

GE Capital Bank	Bid #1:	12% per year, compounded quarterly
Wells Fargo Bank	Bid #2:	3% per quarter, compounded weekly
FMC	Bid #3:	1.10% per month, compounded daily

(10) _B_ 3. Calculate the effective annual interest rate for Bid #1- GE Capital Bank.
- A. 12.93%
- B. 12.55%
- C. 12.00%
- D. 11.64%

$$i_{eff} = \left(1 + \frac{r}{m}\right)^m - 1 = 0.125509$$

$r = 0.12$

$m = 4 \ QTR/yr$

(10) _C_ 4. Calculate the effective annual interest rate for Bid #2 – Wells Fargo Bank.
- A. 11.64%
- B. 12.25%
- C. 12.73%
- D. 13.22%

$r = (0.03)(4) = 0.12$

$m = 52 \ weeks$

$i_{eff} = 0.127341$

(10) _D_ 5. Calculate the effective annual interest rate for Bid #3 – FMC.
- A. 7.53%
- B. 12.21%
- C. 12.88%
- D. 14.11%

$r = (0.0110)(12) = 0.132$

$m = 365 \ days$

$i_{eff} = 0.141081$

(10) _B_ 6. What uniform series over the interval [11,20] will be equivalent to a uniform series of $10,000 cash flows over the interval [1,10] based on an 11%/yr/yr compound interest rate?
- A. $17,906
- B. $28,393
- C. $31,057
- D. $45,944

10,000 ~~(   )~~

$(10,000)(A|P, 11, 10)(F|A, 11, 10)$

$(.16980)(16.72201)$

$= 28394.972$

3

(10) __C__ 7. On John Pearson's twenty-fifth birthday, he invested $10,000 in a tax-deferred retirement account. Each year thereafter, he deposited 6% more than the previous deposit. The account paid annual compound interest of 5%/yr/yr. Immediately after his 28th deposit he died from a prolonged battle with cancer. When settling the estate affairs John's wife, Lisa, needed to find out how much was in the account immediately after the 28th deposit? Therefore, calculate the total amount in the account right after the 28th deposit.

$A_1 = 10{,}000$

$g = 5\%$

$i = 6\%$

$n = 28$

    A. $2,300,000
    B. $1,875,450
    C. $1,191,550
    D. $1,421,550

$$F = A_1 \left[\frac{(1+i)^n - (1+g)^n}{i - g} \right]$$

$$\approx 1191557.558 \; \$$$

(10) __A__ 8. Upon graduation Zachary's first big purchase was a brand new 2016 Chevy Camaro Z-28 with a special power package (7.0L, V8, 505 Hp) for a total price of $68,525. Determine what his monthly payment will be if he was able to finance the car for 72 months at an interest rate of 6% per year compounded monthly.

$P = 68525$

$72\,months$

$6\%/yr/mon$

APP $6yrs$

    A. $1,135 $A_P =$
    B. $1,525
    C. $2,366
    D. $4,142

(10) __D__ 9. Wendy borrows $25,000 at 12% compounded annually; he plans on paying off the loan over a 5-year period with annual payments. Each successive payment is $1,000 greater than the previous payment. Using the Linear Gradient Method what is amount of the first payment?

$P = 25000$

$i = 12\%/yr$

$n = 5yr$

$G = 1000$

    A. $8,160
    B. $7,160
    C. $6,160
    D. $5,160

$A_P = P(A|P, i\%, n) = 25000(0.27741)$

≈ 6935.25

$A = G(A|G, i\%, n) = 1000(1.77459)$

≈ 1774.56

$First\ Payment = A_P - A = 5160.66$

(10) __B__ 10. Using the information from Problem #9 above what will be the amount of the third payment (at the end of year 3)?

    A. $8,160
    B. $7,160
    C. $6,160
    D. $5,160

$First\ payment + 1000 + 1000 \cancel{+1000}$

$= \cancel{8160}$

7160

4

To Find	Given	Factor	Symbol	Name
P	F	$(1+i)^{-n}$	$(P\mid F\ i\%, n)$	Single sum, present worth factor
F	P	$(1+i)^{n}$	$(F\mid P\ i\%, n)$	Single sum, compound amount factor
P	A	$\dfrac{(1+i)^{n}-1}{i(1+i)^{n}}$	$(P\mid A\ i\%, n)$	Uniform series, present worth factor
A	P	$\dfrac{i(1+i)^{n}}{(1+i)^{n}-1}$	$(A\mid P\ i\%, n)$	Uniform series, capital recovery factor
F	A	$\dfrac{(1+i)^{n}-1}{i}$	$(F\mid A\ i\%, n)$	Uniform series, compound amount factor
A	F	$\dfrac{i}{(1+i)^{n}-1}$	$(A\mid F\ i\%, n)$	Uniform series, sinking fund factor
P	G	$\dfrac{[1-(1+ni)(1+i)^{-n}]}{i^{2}}$	$(P\mid G\ i\%, n)$	Gradient series, present worth factor
A	G	$\dfrac{(1+i)^{n}-(1+ni)}{i\,[(1+i)^{n}-1]}$	$(A\mid G\ i\%, n)$	Gradient series, uniform series factor
P	$A_{1,j}$	$\dfrac{1-(1+j)^{n}(1+i)^{-n}}{i-j}$ for $i \neq j$	$(P\mid A_{1}\ i\%, j\%, n)$	Geometric series, present worth factor
F	$A_{1,j}$	$\dfrac{(1+i)^{n}-(1+j)^{n}}{i-j}$ for $i \neq j$	$(F\mid A_{1}\ i\%, j\%, n)$	Geometric series, future worth factor

$$i_{eff} = \left(1 + \frac{r}{m}\right)^{m} - 1 \qquad = \qquad \left(F \mid P\ \frac{r\%}{m}, m\right) - 1$$

◆ r = nominal annual interest rate

◆ m = number of compound periods per year

◆ i_{eff} =EFFECT(r,m)

◆ Irregular Cash Flows

　◆ if we let At denote the magnitude of a cash flow (receipt or disbursement) at the end of time period t, then

$$P = A_1(1+i)^{-1} + A_2(1+i)^{-2} + A_3(1+i)^{-3} + \ldots + A_{n-1}(1+i)^{-(n-1)} + A_n(1+i)^{-n}$$

◆Equation 2.8

◆Period interest rate = $\dfrac{\text{◆Nominal annual interest rate}}{\text{◆Number of interest periods per year}}$

Converting gradient series to present worth

$$P = G\left[\frac{1-(1+ni)(1+i)^{-n}}{i^{2}}\right] \qquad (2.31)$$

$$P = G\left[\frac{(P\mid A\ i\%, n) - n(P\mid F\ i\%, n)}{i}\right]$$

$$P = G(P\mid G\ i\%, n) \qquad (2.32)$$

BISON CONNECT

Davis, Natalie <natalie_davis@ios.doi.gov>

IEM 3503/3513 Test 2

1 message

Moore, Pam <pam.moore@okstate.edu>

Thu, Jun 22, 2017 at 3:16 PM

To: "natalie_davis@ios.doi.gov" <natalie_davis@ios.doi.gov>

Hello,

Attached is Test #2 for IEM 3503/3513 to be taken by ▮▮(b)(6)▮▮

Please either email or fax the completed quiz to enhmwk@okstate.edu or 405.744.5033. Please keep the original copy for your records, the instructor may request it at a later date. (All copies need to remain in your file until a month after the semester ends.)

To verify that the completed exam was received by our office, please take the following steps:
1. Go to http://de.ceat.okstate.edu/
2. Select "Student Services"
3. Select "Homework Log"
4. Select the Course

Students should NOT fax, email or have a copy of the exam at any time other than while completing it!

Professor's Instructions:

o **Time limit is 75 minutes.**

o **Open book, open notes.**

o **Calculator is allowed.**

o **To be taken Thursday, June 22, 2017 through Monday June 26, 2017 by 5:00 pm CST.**

Please don't hesitate to contact us if you have any questions.

Thanks,

PAM MOORE

Distance Education Programs

College of Engineering, Architecture and Technology
101 Engineering North
Stillwater, OK 74078
P: 405-744-5148 F: 405-744-5033
http://ceatde.okstate.edu

2 attachments

IEM 3503_3513 Test #2C_Su17.doc
71K

coversheet - for Proctors Max Barton 2.pdf
231K